

Amendments to the Drawings:

Please replace sheet 1/3, containing Figures 1(a), 1(b) and 1(c) by the attached replacement sheet 1/3. In Figure 1(c), elements 13,13', showing conductive material layers, have been added.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

REMARKSAmendments

In the descriptive part of the specification, paragraphs [0025] and [0030] have been amended to insert an element number, i.e. element 13,13', to identify the conductive material layer.

The Objection to the Drawings

Applicant respectfully traverses the objection to the drawings under 37 CFR § 1.83(a) in view of the amended Figure 1(c). Conductive material layer 13,13' has been identified in Figure 1(c). Basis for this amendment is found in paragraph [0030], which describes the conductive material layers used in combination with the PTC element.

The Rejection Under 35 USC § 103(a)

Applicant respectfully traverses the rejection of claims 1, 4-9, 15 and 17 under 35 USC § 103(a) as unpatentable over Bingo et al. (U.S. Patent No. 4,833,280) in view of Wang et al. (U.S. Patent No. 6,512,446).

As previously stated, the present claims are directed to a switch that includes a conductive movable member and at least first and second terminals. The switch is switchable by mechanically moving the movable member between a state in which the movable member contacts with the two terminals simultaneously and a state in which the movable member is apart from either one of the two terminals. At least one of the first and second terminals comprises a conductive contact part for contacting with the movable member, a conductive connect part for being electrically connected with an external element, and a PTC member located between the contact part and the connect part. As such, the switch provides overcurrent protection, as set out in paragraph [0023]. An important advantage of the switch is that in one embodiment the switch is suited for being mounted directly on a printed circuit board (PCB) substrate so that the PCB substrate holds terminals of the switch in the correct positions to facilitate production of the switch (see paragraph [0023], lines 3-8). In one embodiment, by making the PTC member in the form of a layer which is positioned parallel to the substrate to which the terminals are fixed, conduction through the PTC member is over a relatively large area and over a relatively short thickness. By providing such a high area to thickness ratio, the resistance provided by the PTC

element will be consequently low. A reduction in the overall resistance presented by the switch is advantageous (see paragraphs [0015] and [0023]). A further advantage of one embodiment is that a robust switch is provided. The tendency of parts to become detached from the PTC element is low and the PTC element can be held securely in place by being positioned between conductive material layers, e.g. metal foils, which are connected with contact and connect parts of a terminal which is fixed to the substrate (see paragraphs [0008] and [0014]).

Bingo et al. discloses a slide switch in which a casing surrounds several fixed contacts and several terminals connected to the fixed contacts that extend to the outside of the casing. A slide member inside the casing has a movable contact portion that selectively connects a combination of the fixed contacts. Bingo teaches that a fixed contact (8a) is electrically connected to and may be integrally formed with a projecting terminal (9a), the projecting terminal (column 6, lines 4-12). A movable contact (5) has a spring portion 23 to which are attached in a perpendicular manner spring contact legs (22a,22b) (column 7, lines 16-35). In one embodiment, an electrical connection is provided between fixed contacts 8a and 8b via movable contact 5 when one bent spring contact leg 22a contacts 8a and another spring contact leg 22b contacts 8b (column 8, lines 40-69). In another embodiment, a common central fixed contact 8c can be connected to a common terminal 9c and either terminal 9a or terminal 9b, thus allowing formation of a two-way switch (Figure 9, column 13, lines 13-39). There is no disclosure of a polymer PTC member located between the contact part and the connect part or that the PTC member should have conductive material layers comprising metal foils being located on opposite sides of the PTC material. In addition, there is no suggestion that the presence of such a PTC member would be advantageous or needed for handling high current loads.

The deficiencies of Bingo are not resolved by the addition of Wang et al. Wang discloses an overcurrent protection apparatus in which a current-sensitive element exhibiting positive temperature coefficient (PTC) behavior is composed of a conductive polymer comprising at least one polymer, a conductive filler, and a non-conductive filler. The current-sensitive element (13) is sandwiched between two conductive electrodes (11,12), and each electrode is attached to a conductive metal foil (14,15). The conductive metal foils are used to connect the element in series with the anode or cathode of a battery and are essentially extensions of the conductive electrodes used to make an electrical connection. There is no suggestion that such a device would or should be used in connection with a moveable member.

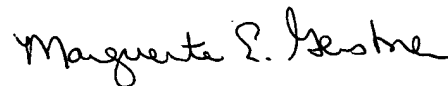
The Examiner has contended that it would be obvious to provide a PTC member located between the contact part (stated by the Examiner to be 8a, 8b, 8c) and the connect part (stated to

be vertical legs of 9a, 9b, 9c), and equates the electrodes of Wang to the contact part and the connect part. Applicant believes that this contention is incorrect. Bingo teaches that the fixed contact and the projecting terminal may be an integral element, a situation that clearly would be defeated if a PTC member were to be "located between the contact part and the connect part" as is stated in the present claims, as such an arrangement would separate the fixed contact and the projecting terminal. Concerning claim 7, the Examiner contends that Figure 8 (believed by Applicant to be Figure 9) has three terminals, meeting all the limitations of the claim. In fact, if a PTC member were positioned as specified in claim 7, i.e. on the second terminal (presumably the vertical leg of 9c, which is not shown), it is unclear how connection to the vertical leg would be made if the PTC member were positioned on top of element 8c. Finally because Bingo does not teach any need for handling high current conditions, there would be no motivation to add a PTC element to Bingo's slide switch. As a result, this rejection is unfounded.

Conclusion

It is believed that this application is now in condition for allowance and such action at an early date is earnestly requested. If, however, there are any outstanding issues which can be usefully discussed by telephone, the Examiner is asked to call the undersigned.

Respectfully submitted,



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